Office of Environmental Laboratory Certification

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The *UPDATE*

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What's New…

Most of you may be aware that Wayne Davis has been promoted to Assistant Bureau Chief for EQC Labs. Carol Smith has been promoted to Director of the Office of Environmental Laboratory Certification. Connie Turner is now with our Office of Quality Assurance. Jamie Berry is the newest member of the Laboratory Certification Program. Congratulations to Wayne, Carol, Connie and Jamie.

New for 2007 – Proficiency Testing (PT) Tables for WP and WS…

There are additional PT samples that are included on the NELAC PT Tables, which have been adopted and approved by the EPA. The acceptance criteria for some compounds have been updated and the Approved Proficiency Testing Providers are using the new criteria. Also additional compounds are included in the tables. Some new compounds are already incorporated in to the DMR-QA Study 26. **Our office will incorporate the analysis of the new compounds for the WS and WP studies in 2007.** We will keep you updated on the new changes. **A list of the new proficiency testing compounds will be posted on our website in November.**

As everyone should be aware, in order to maintain certification in South Carolina, acceptable PT sample results for the laboratory must be **received by December 31st each year** for the Water Supply (WS) and/or Water Pollution (WP) studies. This means that the study the laboratory participates in must begin in the calendar year and end in the calendar year with the results received in our office by December 31. **The PT Provider must submit these studies to this Office. We cannot accept PT results faxed from laboratories. Also remember to document your EPA Lab Code on the results to your provider. If you do not have an EPA Lab Code contact our office and we will provide you with the information to obtain one.**

Studies received in January will not be accepted for meeting the annual PT requirement. If acceptable PT Studies are not received by December 31st, decertification may be initiated. The laboratory will be decertified upon receipt of the decertification letter.

PLEASE NOTE: We no longer send out annual reminders of the PT Studies. All certified labs are required to participate in annual studies as required by Regulation 61-81. Our website has information on the PT Studies and you can call our Office if you have specific questions.

DMR-QA Study 26 - June 2, 2006 – Sept. 1, 2006

The DMR-QA Study is mandatory for all major and selected minor permit holders under the Clean Water Act's National Pollutant Discharge Elimination System (NPDES). The DMR-QA Study evaluates the analytical and reporting ability of laboratories that routinely perform chemical and WET self-monitoring analyses required in NPDES permits that are reported by you in Discharge Monitoring Reports (DMR).

For chemical tests under DMR-QA you are responsible only for those chemical analytes that are both in your permit and in Study 26. Refer to Page 14 of your DMR-QA instructions for a list of analytes. Remember the DMR-QA now has an expanded list of analytes. These new analyte tests are included in the NELAC FoPT tables mentioned on Page1. **The following list includes the ADDITIONAL analyte tests required for the EPA's DMR-QA 26 study.**

- Fecal Coliform, MF or MPN
- Total Coliform, MF or MPN
- Antimony
- Barium
- Beryllium
- Chromium, hexavalent
- Molybdenum
- Silver
- Thallium
- Alkalinity, total ($CaCO_3$)
- Chloride
- Fluoride
- Hardness, total ($CaCO_3$)
- Specific conductance (25ºC)
- Sulfate
- Total Dissolved Solids (180ºC)
- Nitrite as N
- Settleable Solids
- Turbidity

For the WET tests under DMR-QA, you are responsible only for the test organisms that are both in your permit and included in Study 26. You are required to participate even if the test conditions in your permit do not exactly match those in Study 26. If they do not match refer to Page 20 of your DMR-QA WET Testing instructions.

Please ensure that the PT providers used by your contract lab and in-house lab submits DMR-QA results for your facility to our office and that the facility NPDES Number is documented on the report. Without this report, your facility will be considered a non-responder or partial responder.

New Arsenic Rule Takes Effect January 2006…

After January 23, 2006, analytical methods using ICP-AES technology may not be used because the detection limits for these methods are 0.008 mg/L or higher. This restriction means that the two ICP-AES (EPA Method 200.7 and Standard Methods 3120B) approved for use for the MCL of 0.05 mg/L may not be used for compliance determinations with the revised MCL of 0.01 mg/L. Laboratories will be required to use the methodology listed in TableI.I-1. - Approved Analytical Methods (40 CFR 141.23) for Arsenic at the MCL of 0.01 mg/L. Certificates for laboratories currently certified for the withdrawn methods have been amended to exclude these methods for arsenic under the Safe Drinking Water Act. Most

laboratories are already certified for the alternate methods, so there will be minimal impact as a result of this final rule.

If your laboratory is not currently certified for one of the EPA approved methods for arsenic for compliance testing for arsenic at the MCL of 0.01 mg/L, a complete application package for arsenic will be required to become certified to perform this testing. An application and certification checklist can be found at our website www.scdhec.gov/labcert.

If you have any questions concerning the analysis of arsenic under the Safe Drinking Water Act, please contact T. Williams at 803-896-0970.

The Scoop on the new LT2 and DBR Stage 2 Rules…

The purpose of the new Long Term 2 Enhanced Surface Water Treatment Rule (LT2) is to decrease illness associated with the contaminant Cryptosporidium as well as other pathogenic microorganisms. Large public water systems are required to monitor Cryptosporidium for two years. Small public water systems are required to monitor E. Coli. If the E.Coli results exceed certain levels, these systems will then be required to monitor for Cryptosporidium. All laboratories analyzing for E. Coli must be certified for an approved method. For guidance on the LT2, please visit the EPA website at http://www.epa.gov/safewater/disinfection/lt2/compliance.html. The following table lists the approved methods under the LT2 rule for the determination and quantitation of E. Coli.

Total Coliform/*E.coli* (MPN)		SM 9223B Colilert®/Colilert-18® Quanti-Tray®
E.coli Enumeration Membrane Filtration		SM 9222B/9222G
E.coli Enumeration MPN		SM 9221B.1/9221F
E.coli Enumeration (m-TEC)	EPA 1103.1	SM 9213D
E.coli Enumeration (Modified m-TEC)	EPA 1603	
Total Coliform/*E.coli* Enumeration (MI agar)	EPA 1604	
E.coli Enumeration (m-ColiBlue24®)		m-ColiBlue24®[6]

The new Disinfection Byproduct (DBP) Stage 2 rule implements new certification requirements effective 4/1/07. DBPs include Total THMs, HAA5, Bromate, and Chlorite. This includes new PT acceptance criteria and a daily demonstration of the minimum reporting level (MRL). There are also several new methods approved under the DBP Stage 2 as well as the removal of previously promulgated methods. The 18th Edition of Standard Methods is no longer approved under the rule. The 21st Edition of Standard Methods has now been approved for several methods. The new MRLs, PT acceptance criteria, and approved methods can be found on pages 480 and 481 of the new rule.

New GGA Requirement for BOD…

Each day that Biochemical Oxygen Demand (BOD) samples are analyzed, at least one Glucose-Glutamic Acid (GGA) test sample must also be analyzed. This is a change from the current requirement of analyzing a GGA test sample weekly. The GGA test is a standard for the BOD analysis and is required to meet the method specified acceptance criteria for valid results. **Some days may require more than one GGA test**. If the seed or dilution water changes during the workday, a GGA test sample will be required for each different seed or dilution water batch. For example, the laboratory analyzes BODs in the morning using Polyseed, and uses all of that seed on these samples. More

samples are then analyzed in the afternoon using another seed capsule. In this case, a GGA test sample would have to be analyzed with the morning samples **and** another GGA test sample analyzed with the afternoon samples. This is because different seed capsules were used for each set of samples. Similarly, if samples are set up using more than one batch of dilution water, then a GGA test sample must be analyzed using each batch of dilution water. The GGA test is used to test the seed effectiveness and dilution water quality as well as analyst technique. **There must be a GGA test sample that contains the same seed and dilution water as that found in each BOD sample**.

BOD – The 2:1 Rule

The "Frequently Asked Questions" posted on the Bureau of Water's website states that if the depletion of at least 2.0 mg/L is not obtained, the BOD results for that sample are invalid. This statement requires further clarification. The depletion of 2.0mg/L should be interpreted as a detection limit for BOD. Therefore with other analyses the laboratory analyzes the required amount of sample including dilutions in order to achieve a valid reportable number. If the laboratory has analyzed 100% effluent and still does not meet the depletion of at least 2.0mg/L, then the laboratory has met the intent of the method and can report the result as <2.0mg/L.

The laboratory should use as many dilutions necessary so that at least one dilution will deplete at least 2.0 mg/L with 1.0 mg/L remaining. If the laboratory has sample results reported with less than values and has not used up to 100% of sample, then a valid BOD result is not being reported. If several dilutions are being analyzed with the most sample being 100%, then the laboratory is meeting the requirements of the BOD analysis.

We understand that the effluent quality does change from time to time, therefore there may be an analysis where the dilutions used do not result in a depletion of 2.0 mg/L and 100% sample has not been used. We consider this an anomaly and should not be a common occurrence. If no dilutions meet this criterion, the demand should be calculated as a "less than" value based on the reporting limit of 2.0 mg/L using the dilution with the highest portion of sample analyzed. The depletion value of 2.0 mg/L should be multiplied by the reciprocal of the fraction of the sample used to make the dilution, which has the most sample. For instance, if a sample were analyzed using 30, 60, and 150 ml in each of three dilutions and none of the dilutions depleted at least 2.0 mg/L; the dilution with the most sample (150 ml) is used for calculating the reported value. The answer is derived by multiplying 2.0 mg/L (the depletion value) by 2, the reciprocal of 150 ml (sample volume used) divided by 300 ml (total volume of dilution).

For samples without a residual DO of at least 1.0 mg/L, the BOD result must be reported as a greater than value based on the lowest sample volume analyzed. The reporting of a greater than result results in the permittee being out of compliance since a valid BOD result cannot be reported based on the dilutions analyzed. It is therefore even more important for the laboratory to perform enough dilutions to meet the method criteria of a depletion of at least 2.0 mg/L with a residual of 1.0mg/L.

BOD – Blank Depletion

In the June 2005 Update, it is stated that blanks must not deplete more than 0.2 mg/L and that occasionally the blanks may deplete up to 0.5 mg/L. What exactly does "occasionally" mean and how many of these blanks are really allowed? If good laboratory practices are followed and the BOD analyst has good technique for the preparation and analysis of BOD samples, the blanks normally show depletion of 0.2 mg/L or less. However, there are instances when the blanks can show depletion of 0.3 mg/L, 0.4 mg/L, or 0.5 mg/L and greater. It is for this reason that BOD data is reviewed over a specific period of time. The period of time may cover a few days, weeks, or even months. The blanks are reviewed over a period of time to determine how consistent the laboratory meets the blank requirements for the BOD analysis. If the laboratory data shows that the blanks are routinely greater than 0.2 mg/L., then a problem exists and the laboratory must find the source of the problem and correct it immediately before resuming the analysis of samples. If the laboratory data reviewed over a three-month period showed only one instance of a blank depleting 0.5 mg/L and the remaining blank samples showed depletion less than 0.2

mg/L, this would not be considered a deficiency. Laboratory analysts are expected to review the data carefully to recognize any trends and to take corrective actions when required. For example, if the blank samples showed continual depletion greater than 0.2 mg/L over a one-week period, the analyst must be able to determine that there is a problem and to take correction action to ensure the blanks return to normal levels of depletion. The analyst must also document the correction action in the analysis records.

BOD – QA/QC

There have also been discussions about what quality control requirements must be met in order for BOD results to be reportable for regulatory compliance. The quality control requirements listed in Standard Methods include the following:

1) Sample pH must be adjusted to 6.5 to 7.5 when necessary.
2) Any residual chlorine in samples must be dissipated and/or destroyed with sodium sulfite solution.
3) The initial DO reading of all samples must be < 9 mg/L.
4) Samples must be brought to room temperature before making dilutions.
5) Sample dilutions must be set up to ensure that a sufficient number of dilutions have a depletion of at least 2.0 mg/L and a residual DO of at least 1.0 mg/L.
6) Blank samples should not deplete more than 0.2 mg/L and must not deplete more than 0.5 mg/L.
7) The seed correction factor should be between 0.6 and 1.0 mg/L.
8) The glucose glutamic acid (GGA) check must read within 198 $\pm$ 30.5 mg/L.
9) Samples must be incubated for 5 days at 20 $\pm$ 1°C.

For more information on about reporting data on Discharge Monitoring Reports (DMRs) and NPDES Permit compliance, please visit the Frequently Asked Questions web page at http://www.scdhec.gov/eqc/water/html/faqdmr.html.

Carbonaceous BOD (CBOD)

We are awaiting further clarification concerning control limits for CBOD analyses. We are in contact with EPA Region IV and will notify laboratories certified for CBOD if a change in current policy becomes necessary. Please contact our Office if you have questions regarding CBOD certification.

A-1 Medium for Enumerating Fecal Coliforms in Ambient Water and Waste Water

There is continuing concern over the allowed holding time for the prepared A-1 medium stored in screw-capped tubes. Until further clarification is received from the EPA, we are requesting that the prepared A-1 medium in screw-cap tubes be stored at 4^{o}C for no longer than 7 days. By using the most conservative holding time we will avoid having to invalidate any data in the future. Laboratories currently certified for the A-1 method will be notified if the holding time of 7 days changes.

Manual for the Certification of Laboratories Analyzing Drinking Water Samples…

This Office has used the Manual for the Certification of Laboratories Analyzing Drinking Water Samples for a number of years. This manual outlines guidance in certifying laboratories analyzing drinking water samples. The Office has used this to assist in the development and implementation of certification criteria, particularly the microbiology. The manual was updated in January 2005 and we are now in the process of implementing the new January 2005 fifth edition of the manual. You can download a copy of this manual at www.epa.gov/safewater/labcert/labindex.html. If you wish to order the manual, the EPA publication number is EPA815-R-05-004.

Meter calibration…

Laboratories are reminded that meters must be calibrated for each shift worked. For example, if the facility operates three shifts, each of the three shifts must calibrate their instruments. If two shifts are used, the instruments must be calibrated twice. This applies to meters that have daily calibration as a requirement. The intent is that when the personnel that calibrated the instrument leave and new personnel begin analyzing samples, the new personnel must ensure the meter is properly calibrated.

Discrete Analyzers

There are several manufacturers of discrete analyzers. A discrete analyzer is an instrument that provides multiple automated chemical analyses to be performed simultaneously on any given sample using micro-volumes of both sample and reagent. These instruments may be equivalent to currently approved EPA methods, but this must be documented by the manufacturer and reviewed by the South Carolina Office of Environmental Laboratory Certification, unless the manufacturer has been issued an ATP. Presently this office has reviewed equivalency data from Konalabs AquaChem. The methods approved for use with the AquaChem are listed on our web site, along with the list of required documentation from the laboratory seeking to use this instrumentation. The SEAL Analytical AQ2 discrete analyzer and the Westco's "SmartChem" have received ATPs (Alternate Test Procedures) from the EPA for several methods and these do not need to be reviewed by this Office. Contact these manufacturers for a copy of the ATP letter from the EPA for the applicable methods.

In order to facilitate the review process for approval of discrete analyzer methods, our Office is requesting laboratories seeking certification for use of discrete analyzers to submit an application. In addition to all of the normal application requirements, the application must include calibration and analysis data from the laboratory and from the instrument manufacturer for comparison purposes and to determine equivalency to approved methodology. By combining the approval process with the application process, the requests of the laboratories and manufacturers will be addressed at one time and the entire process will be streamlined and take less time.

If you have any questions about discrete analyzers or their use in the lab, please contact this Office at (803) 896-0970.

WEASC Laboratory Workshop "Emerging Issues in the Water/Wastewater Lab"

The Laboratory Committee of the WEASC is presenting a Laboratory Workshop on August 17, 2006 at the Radisson Hotel and Conference Center in Columbia, SC. The topics for the workshop will include the recently promulgated Long Term 2 and Disinfection By-Product Rules for Drinking Water, *Cryptosporidium* Sampling and Analysis, Endocrine Disruptors, and Lab Certification Updates. For additional information on the workshop, please call the WEASC at 803-939-9574 or visit their website at www.weasc.org.

LOD/LOQ…More Acronyms To Understand

We have all become familiar with Method Detection Limits (MDLs) and Practical Quantitation Limits (PQLs), and now there are new acronyms on the horizon. NELAC has developed some terminology to help define the low end of calibration curve and to help identify some level of accuracy at the stated reporting limit.

So, what does all of this mean? Basically, the Level of Quantitation, or LOQ, is equal to the term PQL which is the same thing as the lowest non-zero standard on the calibration curve. NELAC defines the LOQ as "The minimum levels, concentrations, or quantities of target variable (e.g., target) that can be reported with a specified degree of confidence." NELAC has further defined this as the low-level standard

on the calibration curve. The Bureau of Water has worked on developing PQLs for the NPDES program. The PQL is essentially the same as the LOQ. Most laboratories are aware of the PQL table used for NPDES reporting. The PQL Table is on our website at **www.scdhec.gov/labcert**.

The limit of detection, or LOD, is a little more confusing and is optional. It is similar to the current MDL. Specifically, the LOD is defined by NELAC as "An estimate of the minimum amount of substance that an analytical process can reliably detect. An LOD is analyte-and matrix-specific and may be laboratory-dependent."

According to the NELAC standards the LOD does not need to be determined if the laboratory does not report outside the calibration range and if the LOQ is verified with the analysis. The South Carolina Certification Program is still reviewing this new terminology in addition to the NELAC standards. This issue will continue to be discussed and if you have any comments concerning the new terminology and its use in the South Carolina Certification Program we encourage you to send a letter or e-mail to our office.

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